Diese Website verwendet Cookies von Google, um Dienste anzubieten und den Traffic zu analysieren. Deine IP-Adresse und dein User-Agent werden zusammen mit Messwerten zur Leistung und Sicherheit für Google freigegeben. So können Nutzungsstatistiken generiert, Missbrauchsfälle erkannt und behoben und die Qualität des Dienstes gewährleistet werden.

WEITERE INFORMATIONEN OK

An unending variety of topics

Friday, March 03, 2006

Quantum dot control over light and heat

LEDs are more energy efficient and last far longer than light bulbs. But their color range has been rather limited. A graduate student at Vanderbilt University has discovered that you can paint LEDs with quantum dots . The color produced by the quantum dots, nanocrystals of a precise specific size, can be varied by varying the size of the crystal, but the result is usually one specific wavelength. Michael Bowers at Vanderbilt discovered that crystals of cadmium and selenium that contain either 33 or 34 pairs of atoms are both preferentially formed (thus making mass production easy) and emit a broad-spectrum white light akin to the sun or a standard light bulb.

Another interesting application of quantum dots is for more efficient thermoelectric devices, for example devices to cool our increasingly hot silicon computer chips. Quantum dots allow a greater ratio of thermal to electrical conductivity -- that means more heat pumped while retaining control over the electric current.

Also interesting is infrared paint. It seems to me that infrared-scale quantum dot paint might also be used for passive thermal control.

Posted by Nick Szabo at 11:33 AM

3 comments:

jerome said...

That's just the tip of the iceberg. There's also attaching quantum dots to particular biochemicals in order to observe the chemicals, in vivo or otherwise. There are also molecular and quantum computing, displays, and much more.

6:47 PM

Nick Szabo said...

The list of applications is perhaps endless. The focus of my brief post was on the manipulation of heat and light, which tagging

Pages

- Home

About Me

Nick Szabo

"A premier thinker about history, law and economics, and the lessons they have for security." -- Adam Shostack, Emergent Chaos

"Szabo comes out with these essays that leave me in awe." -- Brian Dunbar

"Reading material that is eclectic, challenging and endlessly fascinating." -- Sean McGrath, Propylon

"Like most blogs worth my attention, this blog is updated only infrequently. That is because the authors of blogs worth my attention only post when they have something to say that is true, relevant and not already known by their audience. Most of the human race does not have the skill to know when an idea has these three properties. The skill is particularly rare in the fields of politics and economics, which is why this blog is such a rare and valuable thing." -- Richard Hollerith

View my complete profile

biochemicals with dyes and florescents arguably falls under.

10:59 PM

Jake said...

Great post. The only issue with these LED lights is that because the crystals have different sizes, they decay at different rates. This warm bulb eventually turns sour. A small company has discovered a way to make dots the same size, so that the net color remains the same.

10:20 AM

Post a Comment

Newer Post Home Older Post

Subscribe to: Post Comments (Atom)

Blog Archive

- ► 2018 (1)
- ► 2017 (3)
- ► 2016 (4)
- ► 2015 (3)
- ► 2014 (3)
- ► 2013 (3)
- ► 2012 (8)
- ► 2011 (12)
- ► 2010 (9)
- ► 2009 (29)
- ► 2008 (55)
- ► 2007 (47)
- ▼ 2006 (130)
  - ► December (4)
  - ► November (7)
  - ► October (15)
  - ► September (15)
  - ► August (20)
  - ► July (5)
  - ► June (10)
  - ► May (4)
  - ► April (3)
  - ▼ March (11)
    - Off-the-record conversations for the Internet
    - Shared key generation using quasars
    - Corporate origins of the United States
    - Metabolite prediction
    - Estimating inflation
    - Rawlsians' maximin: preposterous risk aversion
    - The Magna Carta, Pt. I
    - Property in everything: some background to the Mag...
    - BlackBerry settlement

Why are wages flat and inequality growing?

Quantum dot control over light and heat

► February (10)

► January (26)

► 2005 (44)

Simple theme. Powered by Blogger.